Greenidge Multi-Pollutant Control Project

Participant
CONSOL Energy, Inc.

Additional Team Members
AES Greenidge, LLC—host

Environmental Elements Corporation (EEC)—technology supplier

Foster Wheeler Energy Corporation (FWEC)—technology supplier

AEP Pro Serv—construction coordinator

Location
Torrey, Yates County, NY (AES' Greenidge Unit No. 4)

Technology
Single-bed Selective Catalytic Reduction in combination with low-NO_x combustion technology to control NO_x and a circulating dry scrubber with carbon injection to control SO_2, mercury, and acid gases

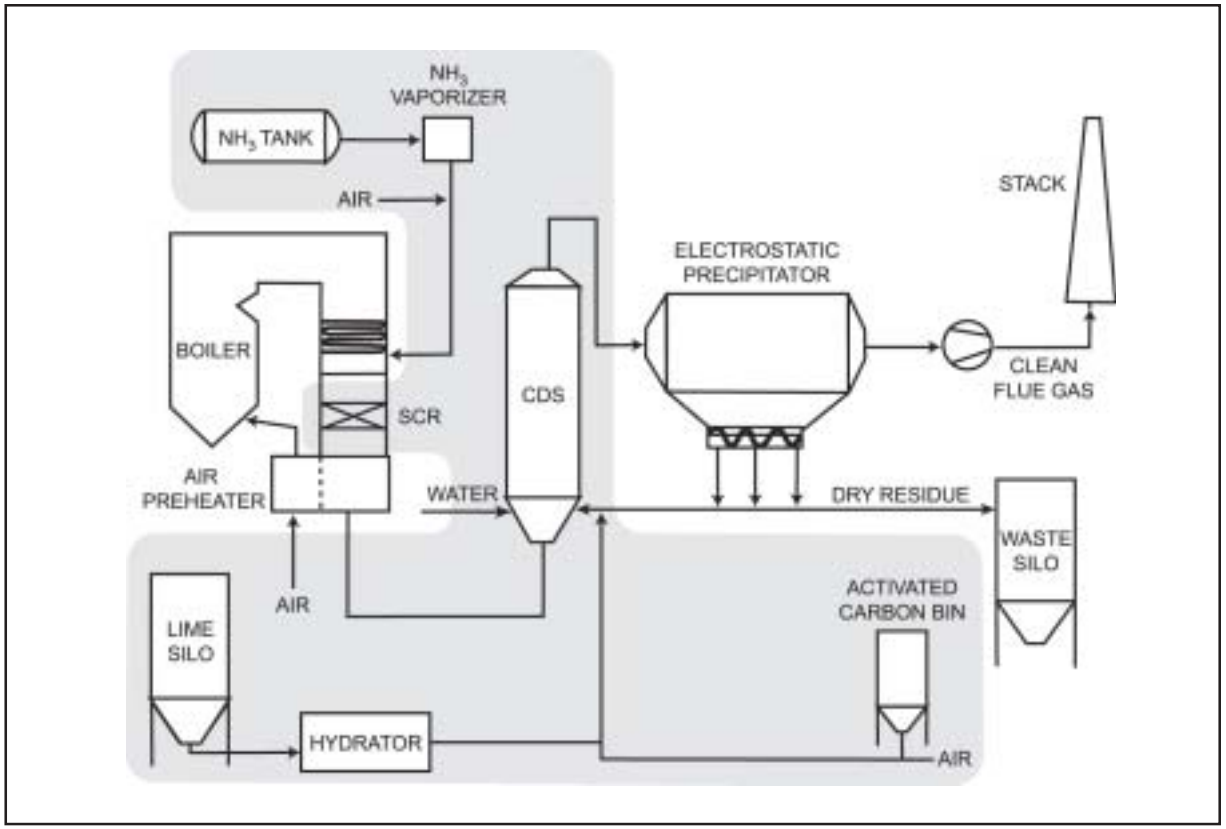
Plant Capacity/Production
104 MW

Coal
Bituminous coal (<2% sulfur) co-fired with up to 10% biomass

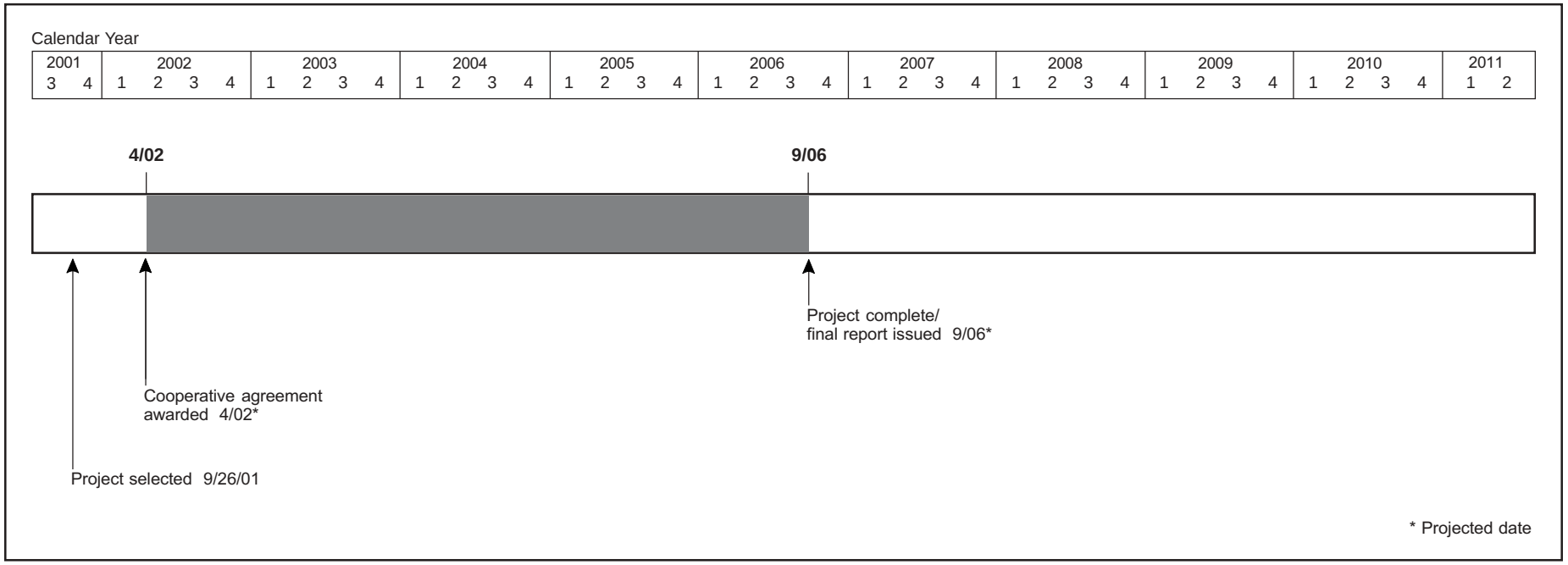
Project Funding

Total Project Cost	$32,800,000
DOE	14,500,000
Participant	18,300,000

Project Objective
To demonstrate a multi-pollutant-control system that can cost effectively reduce NO_x, SO_2, acidic gas, and mercury from smaller coal plants. This project would be the first to demonstrate (1) NO_x reductions to 0.122 lb/10^6 Btu using single bed, in-duct Selective Catalytic Reduction (SCR) combined with a low-NO_x combustion technology on a unit burning coal and biomass, (2) 95% SO_2 removal using a Circulating Dry Scrubber (CDS) from Environmental Elements Corp. on a coal-fired boiler, (3) 90% mercury reduction in the CDS, and (4) more than 95% acid gas (sulfur trioxide (SO_3), hydrochloric (HCl), and hydrofluoric (HF) acids) removal in the CDS. The system is projected to offer 60% NO_x removal for one-third of the capital cost and one-fourth of the operation and maintenance cost of conventional SCR or SNCR technology.



Technology/Project Description
The single-bed, in-duct SCR, in combination with low-NO_x combustion technology, can achieve 60% NO_x reduction for about one-third the capital cost and one-fourth the operating and maintenance cost of a full SCR or Selective Non-Catalytic Reduction (SNCR) system on a 104-MW unit. The capital cost of the CDS system is projected to be less than half that of a conventional flue gas desulfurization (FGD) system. Operating and maintenance costs are less for the CDS system. Activated carbon injection into the CDS unit is projected to use 5 to 10 times less carbon than direct injection into the flue gas duct for a given level of mercury control, because the carbon has a greater average contact time in the CDS bed than in the flue gas duct. Reducing the carbon feed rate results in substantial mercury control cost savings. The CDS system will reduce acid gases (SO_3, HCl, HF) by more than 95%, with the additional benefits of reducing plume visibility and secondary particulate formation. Acid gases must be reported to EPA as part of the Toxic Release Inventory (TRI). The project will also include an evaluation of the impact of biomass co-firing (5–10% of the heat input) on the performance of the SCR and CDS systems.



Project Status/Accomplishments

The project was selected for award on September 26, 2001. Contract negotiations are under way as of the end of fiscal year 2001. The schedule will be finalized when contract negotiations are complete.

The goal of the proposed project is to demonstrate substantial improvements in mercury, SO_3 and fine particulate control, and substantial reductions in the cost for NO_x and SO_2 control, compared to conventional technologies when applied to the large number of smaller coal-fired generating units in the U.S. This project will produce operating and maintenance cost data, reliability and availability data, and process performance data so that generators will accept the risk of installing multi-pollutant control on smaller coal-fired units. Ultimately, the successful demonstration of these technologies will help to ensure the future availability of low-cost electricity from a significant fraction of the U.S. coal-fired generating fleet.

Commercial Applications

Greenidge Unit No. 4 is representative of 492 coal-fired electricity generating units in the United States with capacities of 50–300 MWe. These smaller units, almost one-quarter of the U.S. coal-fired generating capacity, are increasingly vulnerable to fuel switching or retirement as a result of more stringent state and federal environmental regulations. The proposed project will demonstrate the commercial readiness of an emissions control system that is particularly suited, because of its low capital and maintenance costs, to meet the requirements of this large group of smaller existing electricity generating units.